A STERILE DISPOSABLE CRYOEXTRACTOR*† (CRYOPHAKE)

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DURING the past few months a new cryoextractor, the cryophake, has been employed in some forty cataract extractions performed by the staff and residents at Walter Reed General Hospital. The prototype of this instrument‡ was developed by R. David Sudarsky (Mattis, Brady, and Sugana, 1965). It is a sterile disposable unit with a self-contained source of cryogen. It is made of injection-moulded polypropylene plastic and consists of two chambers. The upper chamber encases an aerosol can containing the cryogen, Freon 12, which boils at -29°C . at atmospheric pressure. The lower chamber contains a heat sink of oxygen-free electrolytic copper which protrudes through the plastic handle. The copper is silver plated for aesthetic reasons. The operating tip is approximately 2 cm. in length and 2 mm. in diameter, and is insulated with a thin sheath of teflon. The sheath extends to within 0.5 mm. of the end of the operating tip. The overall length of the instrument, from the actuator button to the end of the operating tip, is approximately 9 in. (Fig. 1, opposite).

The cryophake is operated by depressing the actuator button, thus releasing the liquid cryogen into the heat sink reservoir. The evaporating cryogen extracts heat from the copper sink, lowering the temperature of the operating tip to within approximately 5°C . of the boiling point of cryogen. Cooling to the operating temperature occurs within 5 seconds of activation and low temperature is maintained for a period of 5 to 7 minutes. There is an adequate supply of cryogen available to refill the heat sink reservoir for a second time should a delay in procedure make it necessary.

Clinical prototypes of the instrument utilized replaceable cans of cryogen making it necessary to resterilize the instrument by gas sterilization or cold soak sterilization for each use. The instrument that will be marketed comes sterilized by ethylene oxide gas in a polyethylene package encased in an outer fibre cylinder (Fig. 2, opposite). Stored in this manner the instrument is ready for use at any time. After an unsuccessful attempt at forceps extraction or if need arises for a cryoextractor for a traumatically perforated lens or other difficult lens deliveries, a cryophake may be unwrapped, used, and thrown away.

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‡ This instrument and the cryogen were supplied by Alcon Laboratories, Fort Worth, Texas.

FIG. 1.—Prototype cryophake. The marketed instrument does not disassemble.

FIG. 2.—Disposable cryophake (half actual size).

Although the shaft of the operating tip of the instrument is insulated with a sheath of teflon, inadvertent adherence to the conjunctival flap, the cornea, or the iris can occur as reported with the use of other cryoextractors. These occurrences are infrequent once the operator is familiar with the instrument. Such adhesions can be freed by saline irrigation, usually without disturbing the bondage to the lens. A

corneal suture at 12 o'clock facilitates the opening of the anterior chamber, and after lens extraction can be utilized for closure of the cataract incision. If a round-pupil extraction is performed, the use of a drop of 1:1000 adrenaline in the anterior chamber and/or the Rizutti (1965) iris rake reduces the risk of contact of the instrument with the iris.

The use of the cryophake by our resident staff in both routine and complicated lens extractions has resulted in a higher percentage of capsular grasping on the first application than with the forceps. Bonding and adhesion between the cooled operating tip and the lens capsule has been excellent. On occasion, partial solidification of the lens cortex has allowed removal of a traumatically perforated lens.

The minimal expense, ready availability, and simplicity of use make this instrument ideal for the ophthalmologist having an occasional need for a cryoextractor.

REFERENCES

- MATTIS, R. D., BRADY, H. R., and SUGANA, T. (1965). *Arch. Ophthal. (Chicago)*, **74**, 787.
RIZZUTI, A. B. (1965). *Int. Ophthal. Clinics*, **5**, 41.

ADDENDUM

Since this article was submitted for publication, over one hundred lens extractions have been accomplished with the cryophake at the Walter Reed General Hospital, and it has become the favourite method of cataract extraction by the resident staff.